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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,221	05/29/2008	Sunil Dutt Sharma	03164.0206USWO	8197
23552	7590	02/23/2011	EXAMINER	
MERCHANT & GOULD PC P.O. BOX 2903 MINNEAPOLIS, MN 55402-0903			ENGRAV, MICHAEL LEE	
			ART UNIT	PAPER NUMBER
			3784	
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			02/23/2011	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/587,221	<b>Applicant(s)</b> SHARMA, SUNIL DUTT	
	<b>Examiner</b> MICHAEL ENGRAV	<b>Art Unit</b> 3784	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 May 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☐ Claim(s) 35-38,40-47,49,51-55,57,58 and 60-64 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 35-38,40-47,49,51-55,57,58,60-64 is/are rejected.
- 7) ☒ Claim(s) 35,36,38,40,42,44,52 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07/25/2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/25/2006</u>  | 6) <input type="checkbox"/> Other: _____                          |

***Priority***

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Australia on January 28, 2004. It is noted, however, that applicant has not filed a certified copy of the 2004900376 application as required by 35 U.S.C. 119(b).

***Claim Objections***

Claims 35, 36, 38, 40, 42, 44, and 52 are objected to because of the following informalities: Applicant need to stay consistent with language. In line 2, is second gas adsorbent material the same as second gas adsorbent material which is used throughout the claim application. In line 3, is first material the same as first gas adsorbent material, which is used throughout the claim application. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 41 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant need to either remove the "40" or "38" after "claim" or add an "or" between them. For the purpose of the examination it will be understood as an "or" between the two numbers.

Claim 43 recites the limitation "other fluid stream" in line 1. There is insufficient antecedent basis for this limitation in the claim.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 35-38, 40, 42-43, 45-47, 49, 52-54, 58, 60-61, and 63-64 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-2, 6, 8-13, 15-18, and 20-21 of copending Application No. 12/530322. Although the conflicting claims are not identical, they are not patentably distinct from each other because the examiner understands that the claims in this current applications read on the claims from application 12/530322. For the combination of method claims 35-38, 42-47, and 49 for the method on the current application read on the combination of claims 15-18, and 20-21 of the other application. The device and system 52-54, 58, 60-61, and 63-64 for the current application read on the claims for 1-2, 6, 8-13 of application 12/530322. For the claims have been sustainably rewritten, but it is the inventive method/apparatus that is important when filing a patent. Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other co-pending application. See MPEP 804.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35

U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 35-38, 40, 45-46, and 50 are rejected under 35 U.S.C. 102(b) as being unpatentable by Rockefeller et al. U.S. Patent 5,025,635.

Regarding claim 35, a method for transferring heat using first (i.e. Col 1 line 64—Col 2 line 1) and second (i.e. Col 1 line 64—Col 2 line 1) gas adsorbent materials, the second material being relatively thermally isolated from but in continuous gas communication with the first material (36,37), the method comprising the steps of:

- [i] heating the first material so as to desorbs a gas adsorbed onto the first material whereby the gas passes to and is adsorbed onto the second material (i.e. Col 3 line 60 – Col 4 line 11); and
- [ii] cooling the first material so that the gas is desorbed from the second material and passes therefrom to be re-adsorbed onto the first material (i.e. Col 4 line 32

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– Col 4 line 42 ); whereby the second material is cooled by desorption therefrom of the gas (i.e. Col 2 line 66 – Col 3 line 2).

Regarding claim 36, wherein in step [i] the first material is heated by heat transfer from a relatively hotter fluid stream (i.e. Col 3 line 51 – Col 3 line 54).

Regarding claim 37, wherein the relatively hotter fluid stream is a waste process gas or liquid (i.e. Col 3 line 51 – Col 3 line 54).

Regarding claim 38, wherein, whilst the first material is being heated, the second material is cooled relative to the first material by heat transfer with a cooling fluid stream (i.e. Col 3 line 60- Col 3 line 68).

Regarding claim 40, wherein in step [ii] the first material is cooled relative to the second material by heat transfer to ambient or by heat transfer with a cooling fluid stream (i.e. Col 4 line 19 – Col 4 line 24). The examiner has understood the reference fluid has cooled from the time the gas has left reactor 10 and thus will need to be reheated.

Regarding claim 45, wherein the first gas adsorbent material has a different absorptivity than the second gas adsorbent material (i.e. Col 1 line 64 - Col 2 line 1).

Regarding claim 46, wherein the first gas adsorbent material is a different material than the second gas adsorbent material (i.e. Col 1 line 64 - Col 2 line 1).

Regarding claim 52, heat transfer apparatus comprising a chamber having a first portion(10) which contains a first adsorbent material (i.e. Col 1 line 64— Col 2 line 1) and a second portion (20) which contains a second adsorbent

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material (i.e. Col 1 line 64—Col 2 line 1), wherein the portions are connected so as to always allow continuous gaseous communication (37,36) and are relatively thermally isolated from each other.

Regarding claim 53, wherein the first (10) and second (20) portions are joined by a section which is adapted to minimize conductive heat transfer between the first and second portions whilst allowing the continuous gaseous communication between the portions (36,37).

Regarding claim 54, the section is a conduit having a relatively smaller width than the width of the first and second chamber portions adjacent thereto (Fig 3 shows that the conduit (36,37) is smaller than the containers 10, and 20).

Claims 60-64 are rejected under 35 U.S.C. 102(b) and (e) as being unpatentable by Smith et al. U.S. Patent 7,143,589.

Regarding claim 60, A system for continuously transferring heat from a first fluid stream (820) and for continuously cooling a second fluid stream (420), the system comprising first (406) and second apparatus (408) each able to be brought into thermal communication with the first (820) and second fluid streams (420), wherein each apparatus comprises a chamber (*Fig 9, shows multiple enclosures, and since the enclosure is the same for both enclosures only 1 picture is shown where the enclosure is created by the walls: 801, 822, 822, 812 is the first apparatus and the enclosure created by the walls: 812, 822, 822, 801 is the second apparatus*) having separated first (801) and second (812) adsorbent materials, and each apparatus is operable in the following stages:

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[1] the first material is heated by thermal communication with the first fluid stream so as to desorb a gas adsorbed onto the first material whereby the gas passes to and is adsorbed onto the second material (i.e. Col 10 lines 23-38);

[2] the first material is cooled so that the gas is desorbed from the second material and passes therefrom to be re-adsorbed onto the first material (i.e. Col 10 lines 54-63), with the second material being cooled by desorption therefrom of the gas (*It is well known that desorption is an endothermic process, for a teaching reference look to PG Pub 2004006047*), and the second fluid stream being cooled by thermal communication with the second material (i.e. Col 10 line 28-38); the system further including: whilst the first apparatus is operated under stage [1] to heat the first material of the first apparatus using the first fluid stream (i.e. Col 10 line 17-20), the second apparatus can be operated under stage [2] to cool the second fluid stream by desorption of the gas from the second material of the second apparatus (i.e. Col 10 line 28-38); and then the first fluid stream can be directed to the second apparatus and operated under stage [1] of the second apparatus (i.e. Col 10 line 56-63), and the second fluid stream can be directed to the first apparatus and operated under stage [2] of the first apparatus (i.e. Col 10 line 56-63); to thereby provide for continuous transfer of heat from the first fluid stream and continuous cooling of the second fluid stream (i.e. Col 10 line 63-64).

Regarding claim 61, a plurality of first apparatus and a plurality of second apparatus (Fig 9, shows multiple apparatus, and since the enclosure is the

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same for both apparatus only 1 picture is shown where, 801, 822, 822, 812 is the first enclosure and 812, 822, 822, 801 is the second enclosure).

Regarding claim 62, the first and second apparatus are operated in parallel (i.e. Col 10 line 14).

Regarding claim 63, comprising valve (i.e. Col 10 line 55-56) for selectively switching the flow of the first and second fluid streams respectively between the first and second apparatus and the second and first apparatus, to maintain a continuous transfer of heat from the first fluid stream and a continuous cooling of the second fluid stream (i.e. Col 10 line 62-63).

Regarding claim 64, wherein each of the first (406) and second (408) apparatus comprises a chamber (fig 9) having a first portion which contains a first adsorbent material (406) and a second portion (408) which contains a second adsorbent material, wherein the portions are connected so as to always allow continuous gaseous communication between (424,422), with the portions being relatively thermally isolated from each other.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 44, 49, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rockenfeller et al. U.S. Patent 5,025,635.

Regarding claim 44, Rockenfeller discloses the invention above but, Rockenfeller does not teach the second material being heated by heat transfer, just enough to restore its temperature to a previous step level. However, one of ordinary skill in the art at the time the invention was made would have been recognized that the second material will heat up after absorbing energy from the surrounding area till the evaporator is at ambient temperature is thus a result of effective variable. It has been held that finding an optimum working range for a result effective variable is a matter of only routine skill in the art. Refer to MPEP 2144.05 Obvious of Ranges.

Regarding claim 49, Rockenfeller discloses the invention above but, Rockenfeller does not teach the fluid being pressurized to .5 MPa. However, one of ordinary skill in the art at the time the invention was made would have recognized the pressure to which the fluid is pressurized to determine the amount of cold produced is thus a result of effective variable. It has been held that finding an optimum working range for a result effective variable is a matter of only routine skill in the art. Refer to MPEP 2144.05 Obvious of Ranges.

Regarding claim 51, wherein, Rockenfeller discloses the invention above but, Rockenfeller does not teach the gas and first and second material are at ambient temperature prior to step [i]. However the examiner has understood this to a thermodynamic property common to all heat transfer. When two systems, each internally in thermodynamic equilibrium at a different temperature, are

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brought in contact with each other they exchange heat to establish a thermal equilibrium between each other. So the equipment could be at ambient temperature before the system is turned on or after just being built.

Claims 41-43, 57 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Rockenfeller et al. U.S. Patent 5,025,635 in view of Hirao et al. U.S. Patent 6,237,357 B1.

Regarding claim 41, 42, 43, and 57 Rockenfeller teaches the claimed invention above and then further teaches the second material is being cooled by the desorption of the gas (i.e. Col 4 line 6-8), but fails to teach: the second material is used to cool another fluid. Where the cooling fluid could be ambient air, process gas or liquid that requires cooling and the first and second chambers are positioned midstream of the fluid to transfer heat between.

However Hirao teaches the second material is used to cool another fluid (25 used to cool air pushed by fan 24). Where the cooling fluid is ambient air, process gas or liquid (i.e. Col 2 line 50-53) that requires cooling and the first (21) and second (25) chambers are positioned midstream of the fluid to transfer heat between (Fig 1 show that the chambers are positioned behind a fan 22, 24 to push air thru the chambers).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Rockenfeller to have the cooling material cool air, and the heating and cooling chambers within the air

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stream for the purpose of having effective forced air heat transfer for enjoyable enclosure temperatures.

Claims 47, and 58 rejected under 35 U.S.C. 103 (a) as being unpatentable over Rockenfeller ET al. U.S. Patent 5,025,635 in view of Guillot et al. U.S.

Patent 5,522,228.

Regarding claim 47 and 58, Rockenfeller teaches the invention above and then further teaches that the gas adsorbed into the first and second material is carbon dioxide (i.e. Col 3 line 19-28). But, Rockenfeller fails to teach that the first gas adsorbent material is a zeolite, the second gas adsorbent material is activated carbon.

However, Guillot teaches the first and second materials are zeolite (i.e. Col 3 line 17) and activated carbon (i.e. Col 2 line 49-50) respectively.

Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Rockenfeller to have the adsorbent materials be zeolite and activated carbon for adsorbing and reabsorbing carbon dioxide for the production of cold else ware in the system as taught by Guillot for the purpose of being able to operate the device without a valve to control the coolant.

Claim 55 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Rockenfeller ET al. U.S. Patent 5,025,635 in view of Smith et al. U.S. Patent 6,701,724.

Regarding claim 55, Rockenfeller discloses the invention above and then further shows: one or more heat transfer elements are arranged in each of the first and second chamber portions together with the first and second adsorbent materials. But, Rockenfeller does not teach the heat transfer element comprising a metal wire mesh that enhances thermal communication between the exterior of the chamber and the adsorbent material.

However Smith teaches a metal screen in the absorber that is capable to enhance the thermal communication between the exterior of the chamber and the adsorbent material for both first and second material.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the multiple heat transfer elements as taught by Rockenfeller with adsorbent materials with a metal wire mesh running thru the adsorbent material as taught by Smith, to increase the speed of thermal communication and adsorbent/absorbent of coolant within the enclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL ENGRAV whose telephone number is (571)270-7042. The examiner can normally be reached on 7:30-5 M-F except F on the first pay period..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jules Frantz can be reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael Engrav/  
(571)270-7042